What is claimed is:

- 1. An apparatus for measuring contact pressure between two surfaces, comprising:
- at least one deformable probe having a flow passage therein, the probe being adapted to be inserted between the two surfaces such that the flow passage is substantially blocked in a first operative position of the probe;
 - a fluid flow generator coupled to the probe;
 - a fluid flow meter coupled between the fluid flow generator and the probe; and
 - a manometer coupled between the fluid flow generator and the probe.
 - 2. The apparatus of claim 1, wherein the probe is tubular.
 - 3. The apparatus of claim 1, wherein the probe is formed of a rubber material.
 - 4. The apparatus of claim 3, wherein the probe is formed of silicone rubber.
- 5. The apparatus of claim 1, wherein the fluid flow meter and the manometer are adapted to communicate with a data acquisition system.
- 6. The apparatus of claim 5, further comprising a data acquisition system in communication with the fluid flow meter and the manometer.
- 7. The apparatus of claim 6, wherein the data acquisition system is in communication with the fluid flow generator.
- 8. The apparatus of claim 1, wherein one of the two surfaces is a cushion of a breathable gas mask and another of the two surfaces is skin.
- 9. The apparatus of claim 1, wherein the two surfaces are, respectively, a contact surface of an item selected from the group consisting of shoes, harnesses, prosthetics, orthotics, breathable gas mask headgear, and backpacks, and a contact surface of a human body.
 - 10. A method of measuring a contact pressure between two surfaces, comprising:

inserting at least one deformable probe having at least one flow passage therein between the two surfaces such that the flow passage is substantially blocked in a first operative position;

generating fluid pressure within the probe;

measuring the fluid pressure within the probe;

measuring fluid flow through the probe; and

recording the fluid pressure at which the fluid flow through the probe increases beyond a baseline flow value as the contact pressure.

- 11. The method of claim 10, wherein the baseline flow value is essentially zero.
- 12. The method of claim 11, wherein the baseline flow value is measured when the probe is in the first operative position between cushion and the face.
- breathable gas mask and a surface of the face, respectively.
- 14. The method of claim 10, wherein the two surfaces are a contact surface of an item selected from the group consisting of shoes, harnesses, prosthetics, orthotics, breathable gas mask headgear, and backpacks, and a contact surface of the human body.
- 15. A method of dynamically measuring and monitoring contact pressure between a cushion of a breathable gas mask and a portion of the face, comprising:
- (a) inserting at least one deformable probe having at least one flow passage therein between the cushion of a breathable gas mask and the face such that the flow passage is substantially blocked in a first operative position;
 - (b) generating fluid pressure within the probe;
 - (c) measuring the fluid pressure within the probe;
 - (d) measuring fluid flow through the probe;
- (e) recording the fluid pressure at which the fluid flow through the probe increases beyond a baseline flow value as the contact pressure;
 - (f) optionally, decreasing the fluid pressure within the probe; and repeating (b) (f) one or more times to create a contact pressure map.

- 16. A method of designing a breathable gas mask, comprising: performing the method of claim 15; creating a breathable gas mask modified in accordance with the contact pressure map; and optionally, verifying the fit of the modified breathable gas mask.
- 17. The method of claim 16, wherein said verifying comprises performing the method of claim 15 using the modified breathable gas mask.
 - 18. A method of creating an anthropometric model of a face, comprising: performing the method of claim 15; and creating the anthropometric model of the face based on the contact pressure map.
- 19. The method of claim 18, wherein the anthropometric model is a computational model.
 - 20. The method of claim 18, wherein the anthropometric model is a physical model.
- 21. The method of claim 18, wherein the anthropometric model is dimensioned to mean anthropometric values generated from contact pressure maps of several experimental subjects.